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22 East Dudley Town Road
Bloomfield, CT 06002
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Tune-up Kit for Models 440/445/440A/450A/450B P/N 019305

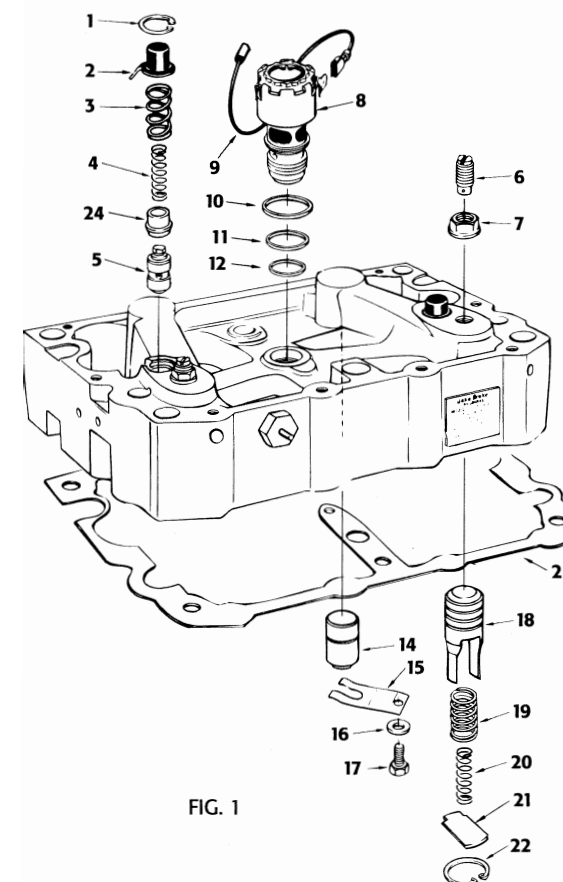


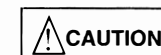
FIG. 1

Illus. No.	P/N	Part Name	Quan.
1	011284	Retaining Ring	6
2	011252	Control Valve Cover	6
3	007500	Inner Spring, Control Valve	6
4	011253	Outer Spring, Control Valve	6
5	039022	Control Valve	6
9	021296	Harness, Solenoid	3
10	001081	Upper Seal Ring	3
11	001082	Middle Seal Ring	3
12	001083	Lower Seal Ring	3
15	017412*	Flat Spring (440/445/440A)	6
15	018792**	Flat Spring (450A/450B)	6
16	001030	Washer	6
17	001492	Hex-head Cap Screw	6
23	016846	Gasket, Brake Housing	3
24	011251	Control Valve Collar	6
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Instructions

For additional information on Models 440/445/440A engine brakes, refer to Jacobs Engine Brake Installation Manual, P/N 018102. For additional information on Models 450A/450B engine brakes, refer to Jacobs Engine Brake Installation Manual, P/N 019308.

Use OSHA-approved cleaning solvent for cleaning parts. Original parts to be reused should be inspected for wear and replaced as required. Wear safety glasses where indicated.



THIS KIT CONTAINS TWO FLAT SPRING GROUPS: ONE FOR JAKE BRAKE MODELS 440/445/440A AND THE OTHER FOR JAKE BRAKE MODELS 450A/450B.

PRIOR TO PERFORMING A JAKE BRAKE TUNE-UP, TAKE NOTE OF THE JAKE BRAKE MODEL NUMBER FROM THE NAMEPLATE ON THE SIDE OF THE HOUSING TO ASSURE PROPER FLAT SPRING USAGE. DISCARD UNUSED FLAT SPRINGS.

Access Engine Brake

1. Thoroughly clean engine and brake housings.
2. Disconnect the wire harnesses at the engine brake housings (3 places).
3. Remove in this order: rocker lever covers, cover gaskets, housing mounting screws and engine brake housings.
4. Remove and discard engine brake housing gaskets (23).

Disassemble Housings

1. Remove the solenoid harness (9) and valve (8); discard harness and three seal rings (10, 11, 12).



CONTROL VALVE COVERS (2) ARE UNDER TENSION FROM CONTROL VALVE SPRINGS (3, 4). REMOVE COVERS CAREFULLY AND WEAR SAFETY GLASSES.

3. Hold down control valve cover while removing the retaining ring (1). Remove and discard covers (2), springs (3, 4), collar (24), control valves (5) and retaining rings (1).
4. Remove master piston (14); discard flat spring (15), washer (16) and capscrew (17). Save the master piston.



SLAVE PISTONS (18) ARE RETAINED BY HEAVY SPRINGS (19, 20). TO AVOID INJURY WHEN REMOVING THE SLAVE PISTON, USE PROPER TOOLS AND WEAR SAFETY GLASSES.

5. Remove locknut (7) from slave piston adjusting screw (Auto-Lash®) (6) and back out screw until the slave piston is fully retracted.
6. Install the slave piston tool, P/N 017397, (Fig. 2) with the adjusting screw fitted into the hole in the tool.

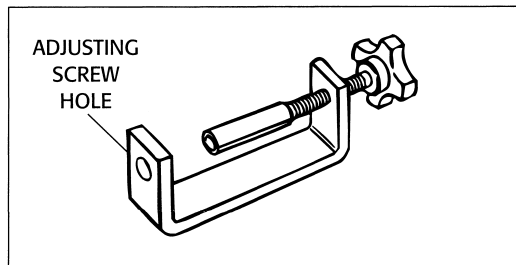


FIG. 2

7. Compress the slave piston springs and remove the retaining ring (22).
8. Remove the slave piston tool and then remove the retainer (21), springs (2), slave piston and adjusting screw.

Assemble Housings

1. Clean housings and all parts in cleaning solvent. Dry with compressed air.
2. Coat all parts to be installed into housings with clean lube oil.
3. Install the original slave piston, reversing the removal procedure.

NOTE:

BEFORE REMOVING THE SLAVE PISTON TOOL, ROTATE THE RETAINING RING 90° FROM THE SLOT IN THE HOUSING.

4. Remove the slave piston tool and install the adjusting screw locknut (do not compress slave piston and springs).

5. Install new control valves, collars (note “UP” position) springs, covers and retaining rings.
6. Install original master pistons with new flat springs (refer to “Caution” note on page 1), washers and capscrews.

NOTE:

WHEN TIGHTENING SCREW, BE SURE THAT THE SPRING LEGS ARE CENTERED AROUND MASTER PISTON BOSS.

7. Install the lower (smallest) solenoid seal ring in the bottom of the solenoid valve bore and the upper and center seal rings on the solenoid valve. Insert the solenoid valve into the bore. Tighten to 110 lbin. (12 N•m).
8. Connect new solenoid harness from the solenoid valve to the electrical connector.

Install Engine Brake Housings

1. Before installing the housings, make sure the slave piston adjusting screws (Auto-Lash) is backed out allowing the slave piston to bottom in the housing bore (screw is loose).
2. Position the gaskets (3) on the rocker lever housings.
3. Install the three engine brake housings on the rocker lever housings. Install the six mounting screws into each housing. Tighten the screws in steps, following the pattern illustrated in Fig. 3. First tighten to 35 lbft. (48 N•m), then to 70 lbft. (95 N•m).

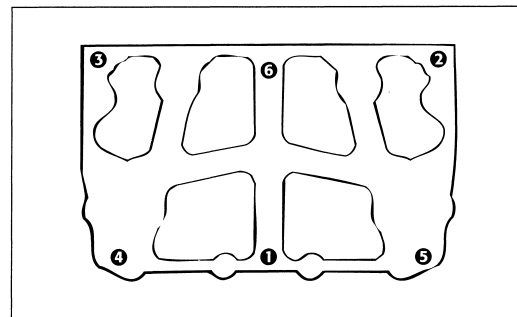


FIG. 3

Slave Piston Adjustment



SLAVE PISTON ADJUSTMENT MUST BE MADE WITH THE FEELER GAGE POSITIONED UNDER BOTH FEET OF THE SLAVE PISTON. INCORRECT ADJUSTMENT CAN CAUSE ENGINE DAMAGE.

1. Adjust the slave piston clearance with the engine stopped and cold. Stabilized water temperature of 140° F. (60° C.) or below. Exhaust valves, on the cylinder to be adjusted, must be in the closed position.
2. Jacobs feeler gage, P/N 017685, has 0.023” feeler stock on both ends. One end can be used on cylinders 1, 3 and 5; the other end can be used for cylinders 2, 4 and 6. (see Figs. 4 and 5).

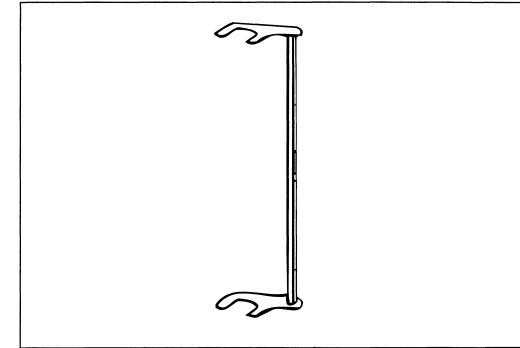


FIG. 4

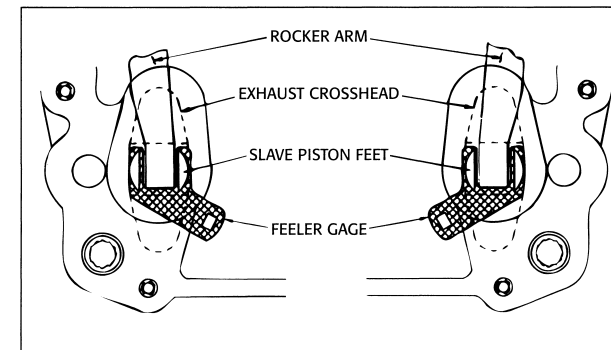


FIG. 5

3. On cylinders with the exhaust valves closed (crossheads loose), install one end of the feeler gage under both feet of the slave piston. Turn slave piston adjusting screw (Auto-Lash®) in clockwise direction until a slight drag is felt on the feeler gage. Hold the adjusting screw and tighten the locknut to 25 lbft. (35 N•m).
4. Continue adjusting the remaining slave pistons where the exhaust valves are closed. Rotate the engine crankshaft about 180° to adjust the remaining slave pistons.

Engine Brake Operational Check

That completes the Jacobs Tune-up Kit installation. The following procedures should now be followed:

1. Connect wire harnesses to the electrical connector on the engine brake housings.



WEAR EYE PROTECTION; DO NOT EXPOSE YOUR FACE OVER ENGINE AREA. TAKE PRECAUTIONS TO PREVENT OIL LEAKAGE ONTO THE ENGINE. WHEN ENGINE IS RUNNING AND VALVE COVERS ARE REMOVED, OIL SPLASHING IN THE ENGINE BRAKE AREA COULD CAUSE PERSONAL INJURY.

2. To bleed brake units and check their operation, start engine and allow to run 5 to 10 minutes.
3. With the engine brake switch off, accelerate engine to approximately 1800 RPM.
4. Release throttle and manually depress each solenoid disk at the top of the solenoid.
5. Repeat this procedure five or six times to permit engine oil to fill the brake housings.